Aboriginal health

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Abstract • Résumé

Objective: To inform health care workers about the health status of Canada's native people.

Data sources: A MEDLINE search for articles published from Jan. 1, 1989, to Nov. 31, 1995, with the use of subject headings "Eskimos" and "Indians, North American," excluding specific subject headings related to genetics and history. Case reports were excluded. Material was also identified from a review of standard references and bibliographies and from consultation with experts.

Study selection: Review and research articles containing original data concerning epidemiologic aspects of native health. Studies of Canadian populations were preferred, but population-based studies of US native peoples were included if limited Canadian information was available.

Data extraction: Information about target population, methods and conclusions was extracted from each study.

Results: Mortality and morbidity rates are higher in the native population than in the general Canadian population. The infant mortality rates averaged for the years 1986 to 1990 were 13.8 per 1000 live births among Indian infants, 16.3 per 1000 among Inuit infants, and only 7.3 per 1000 among all Canadian infants. Age-standardized all-cause mortality rates among residents of reserves averaged for the years 1979 to 1983 were 561.0 per 100 000 population among men and 334.6 per 100 000 among women, compared with 340.2 per 100 000 among all Canadian men and 173.4 per 100 000 among all Canadian women. Compared with the general Canadian population, specific native populations have an increased risk of death from alcoholism, homicide, suicide and pneumonia. Of the aboriginal population of Canada 15 years of age and older, 31% have been informed that they have a chronic health problem. Diabetes mellitus affects 6% of aboriginal adults, compared with 2% of all Canadian adults. Social problems identified by aboriginal people as a concern in their community include substance abuse, suicide, unemployment and family violence. Subgroups of aboriginal people are at a greater-than-normal risk of infectious diseases, injuries, respiratory diseases, nutritional problems (including obesity) and substance abuse. Initial data suggest that, compared with the general population, some subgroups of the native population have a lower incidence of heart disease and certain types of cancer. However, knowledge about contributing factors to the health status of aboriginal people is limited, since the literature generally does not assess confounding factors such as poverty.

Conclusions: Canadian aboriginal people die earlier than their fellow Canadians, on average, and sustain a disproportionate share of the burden of physical disease and mental illness. However, few studies have assessed poverty as a confounding factor. Future research priorities in native health are best determined by native people themselves.

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Objectif : Informer les travailleurs de la santé au sujet de l'état de santé des autochtones du Canada.

Sources de données : Recherche dans MEDLINE d'articles publiés entre le 1er janv. 1989 et le 30 nov. 1995 en utilisant les vedettes-matière «Eskimos» et «Indians, North American», à l'exclusion des vedettes-matière spécifiques liées à la génétique et à l'histoire. Les rapports de cas ont été exclus. On a aussi repéré des documents à la suite d'une revue des ouvrages de référence et des bibliographies standard et après avoir consulté des experts.

Sélection d'études : Articles de revue et de recherche contenant des données originales sur des aspects épidémiologiques de l'état de santé des autochtones. On a privilégié les études sur des populations canadiennes, mais inclus aussi des études démographiques sur des peuples autochtones des États-Unis si les renseignements canadiens disponibles étaient limités.

Extraction des données : On a tiré de chaque étude des données sur la population cible, les méthodes et les conclusions.

Résultats : Les taux de mortalité et de morbidité des peuples autochtones sont plus élevés que ceux de la population en général au Canada. De 1986 à 1990, les taux annuels moyens de mortalité infantile se sont établis à 13,8 par 1000 naissances vivantes chez les nourrissons indiens, 16,3 par 1000 chez les nourrissons inuit et 6,3 seulement par 1000 chez tous les nourrissons nés au Canada. De 1979 à 1983, les taux annuels moyens de mortalité des résidents des réserves, attribuables à toutes les causes et normalisés en fonction de l'âge, se sont établis à 561,0 par 100 000 habitants chez les hommes et 334,6 par 100 000 chez les femmes, comparativement à 340,2 par 100 000 chez tous les hommes et 173,4 par 100 000 chez toutes les femmes du Canada. Comparativement à la population du Canada en général, le risque de décès causé par l'alcoolisme, les homicides, les suicides et la pneumonie est plus élevé dans certaines populations autochtones en particulier. Chez les autochtones du Canada âgés de 15 ans et plus, 31 % ont appris qu'ils ont un problème de santé chronique. Le diabète sucré atteint 6 % des autochtones adultes, comparativement à 2 % de tous les adultes du Canada. La toxicomanie, le suicide, le chômage et la violence familiale, notamment, sont les problèmes sociaux que des autochtones considèrent comme une préoccupation dans leur communauté. Des sous-groupes d'autochtones sont exposés à un risque plus élevé que la normale de maladies infectieuses, de blessures, d'affections respiratoires, de problèmes de la nutrition (y compris l'obésité) et de toxicomanie. Selon les données initiales, l'incidence de cardiopathies et de certains types de cancers est plus faible dans certains sous-groupes d'autochtones que dans la population en général. Les connaissances sur les facteurs qui contribuent à l'état de santé des autochtones sont toutefois limitées, puisque les écrits n'évaluent pas en général des facteurs de confusion comme la pauvreté.

Conclusion : Les autochtones du Canada meurent plus jeunes que leurs concitoyens, en moyenne, et ils supportent une portion disproportionnée du fardeau des maladies physiques et mentales. Peu d'études ont toutefois évalué la pauvreté comme facteur de confusion. Ce sont les autochtones eux-mêmes qui sont les mieux placés pour déterminer les priorités des recherches futures sur l'état de santé des autochtones.

This special review of aboriginal health has been prepared at the request of the Canadian Task Force on the Periodic Health Examination to inform health care workers about the health of Canada's native people. Administrative changes at the Medical Services Branch (MSB) of Health Canada may result in increased access by native people to a variety of health care systems. Physicians may find that they are seeing more native people, and they should be aware that some health problems are highly prevalent in this population.

This article provides an overview of health issues identified in the literature as relevant to aboriginal people, but it does not issue practice guidelines.[1] The task force considers native health an area of importance that has received insufficient attention; however, specific recommendations are best determined by native people themselves.

In this article the terms "native" and "aboriginal" will be used interchangeably to refer to people whose ancestors were indigenous to Canada. These people include status or registered Indian people, nonstatus Indian people, Métis people, Inuit people and people of other cultures within each of these designations.[2] Many aboriginal people object to the term "Indian"; therefore, this term is used only when required to describe information from the original source accurately.

Brief history of health care in aboriginal communities

To understand the current health issues of native people, it is important to be familiar with their history in relation to the Canadian government and to health care.[3,4] Table 1 briefly outlines this history and identifies the historical lack of coordination in the provincial and federal provision of native health care. There is an increasing emphasis on adapting the delivery of health services to the specific needs of aboriginal communities and on transferring the responsibility for health care to these

communities. As a result, in the future, Canadian health care workers may see more native people as these people seek care from a variety of services.

Methods

Data sources

We searched the medical literature for articles published between Jan. 1, 1989, and Nov. 31, 1995, with the use of the following strategies. MEDLINE was searched with the use of MeSH headings "Eskimos" and "Indians, North American," excluding headings pertaining to genes, genetics and the history of medicine. Case reports were excluded. Material was also identified from a review of standard references and their bibliographies. Experts were consulted as well; books and unpublished reports were not used unless specifically recommended by an expert.

Study selection

Review and research articles containing original data concerning the health status of native people were included. Government documents were included if they were recommended by experts or reviewers. All citations retrieved from the search were reviewed independently by two of us (H.L.M. and A.B.M.). The following criteria were used to determine whether the article was relevant: the target population was aboriginal people (preferably Canadian populations), the topic was health status or health determinants, and the type of article was a review or original research article.

Data extraction

Information about target population, methods and conclusions was extracted from each study. Preference was given to information from population-based studies or community samples. If information about Canadian populations was unavailable or sparse, data about US populations were included.

Data synthesis

Information was organized by the following subjects: health determinants, age- and sex-adjusted mortality rates, disease-specific morbidity rates, and common social and mental health problems.

Burden of suffering

Although a number of conditions are thought to be more prevalent in the native population than in the general Canadian population, there is a paucity of information available to determine the extent of these differences precisely.[4,7] In evaluating and understanding the health status of native people, it is important to review health determinants common to all populations, including socioeconomic status, environmental conditions, access to health care, nutrition and maternal health.

Health determinants

A heterogeneous population and large differences in geographic and climatic conditions and in the degree of urbanization among native people make it difficult to

Table 1: Brief history of relations between native peoples and the federal government, especially those affecting health care in aboriginal communities

Year	Event	Comment
1763	Royal Proclamation	British Crown acknowledged aboriginal nations, including aboriginal title to uncolonized lands.[3]
1867	British North American Act	Act gave jurisdiction over aboriginal people and their lands to Canadian government.[3]
1876	Indian Act	On paper, this act was supposed to entitle registered Indians on reserves to housing, education and health care. In reality, it infringed severely on the rights of native people; it specified that almost all decisions made by native bands required approval by government.[4]
1945	Indian health services policy shift	Department of Indian Affairs transferred responsibility for delivery of Indian health services to the Department of National Health and Welfare.[5]
1951	Revision of Indian Act	Some restrictions were removed, but government retained ultimate jurisdiction.[4]
1962	Establishment of Medical Services Branch (MSB)	Since its inception, MSB of the Department of National Health and Welfare has overseen administration of health services to native people.[6] Although provincial programs currently provide diagnostic and treatment services to native people, MSB is responsible for community services and some hospitals in remote areas.[4]
1982	Constitution Act	New constitution affirmed the existing aboriginal and treaty rights of Canada's native people.[3]
1985	Act to Amend the Indian Act (Bill C-31)	This bill was an attempt to rectify some of the inequities of the Indian Act. For example, before passage of this bill, status Indian women who married non-native men lost their status under the Indian Act.[4]
1992	Brighter Futures Program	Federal government devoted a large component of this program to providing community mental health services in aboriginal communities.[4]

gather meaningful and representative data about their health needs. To understand the health issues of native people, it is essential to have some knowledge of the conditions in which they live.[4,8–13]

Socioeconomic status

According to the 1991 Aboriginal Peoples Survey, the rate of unemployment among aboriginal adults (15 years of age and older) was almost 25%; by comparison, the rate in Canada's total population was 10%.[9] Indian people living on reserves have the highest rate of unemployment, at 31%.[9] Total income for adults in 1990 was lower among aboriginal people than among all Canadians. Of the aboriginal population surveyed, 54% had a total annual income below $10 000, compared with 35% of Canada's total population.[9] The proportion of single-parent families among Indian and Inuit people in 1986 was at least 19%, whereas among Canadians overall it was 13%.[12] Aboriginal people generally live in poor housing, and only a small number of communities have adequate water supplies and waste disposal.[4] Approximately 8% of the respondents to the Aboriginal Peoples Survey older than 15 years of age reported that the availability of food was a problem.[8]

Environmental conditions

Aboriginal people, particularly those who follow a traditional lifestyle,[4] are susceptible to environmental contaminants; exposure to heavy metals such as mercury and to organic chemicals such as polychlorinated biphenyls (PCBs) is common. A recent study involving Inuit women in northern Quebec showed that their breast milk had a total PCB concentration seven times greater than the concentration in the breast milk of women of European descent living in southern Quebec.[14] High levels of mercury have been found in some native people in northern Ontario and Quebec.[4] A study of exposure to trace metals through traditional food sources of Inuit people in a Baffin Island community concluded that the mean daily intake of mercury was much higher (65 μg for women and 97 μg for men) than the mean daily intake for all Canadians (16 μg).[15]

Access to health care

Aboriginal people have less access to health care services than other Canadians because of geographic isolation and a shortage of personnel trained to meet the needs of the native population.[4,16] Approximately 30% to 50% of aboriginal communities are in remote regions, many accessible only by air.[4] Although a detailed discussion of inequities in health care is beyond the scope of this review, there are clearly major gaps in services, particularly in resources for mental health care.[4] In addition, aboriginal people have been underrepresented in the Canadian health care workforce.

Nutrition

Obesity is a major health problem among Canada's native people. Young and Sevenhuysen[17] surveyed 704 Cree and Ojibwa adults in northwestern Ontario and northeastern Manitoba. In some age and sex groups (e.g., women between 45 and 54 years of age), almost 90% of respondents had a body mass index in the overweight or obese range. A survey of Cree and Inuit people in northern Quebec showed that obesity was much more common among Cree women than Cree men.[18] Among the Inuit people surveyed, there was a tendency toward being overweight, but obesity was much less common.[18]

Evaluation of obesity among children should take into account recent findings suggesting that Inuit and Inupiat children display a pattern of growth that differs from that of other children. Jamison[19] found that there is a high-weight-for-height pattern among arctic children, including Canadian Inuit children. This pattern should not be misinterpreted as obesity. Two other recent studies of Canadian Inuit youth have shown similar patterns of high weight for height.[20,21]

Major nutritional problems identified during the past 20 years include iron deficiency and low intake of vitamin D among pregnant native women and infants.[22–24] Moffatt[22] found that more than 50% of a sample of native children living in Winnipeg who had originated from Manitoba reserves had iron deficiency anemia. Many native children do not receive fluoride supplementation (in areas where water supplies are unfluoridated); as a result, dental caries is an extremely common problem.[25]

Maternal health

Maternal health is an important determinant of outcomes in pregnancy.[26] Godel and associates[27] found that smoking, caffeine consumption and binge alcohol drinking were more frequent among the Inuit and Indian mothers than among the non-native mothers in the Northwest Territories, although the proportion of mothers who drank alcohol did not differ among the groups. Lack of standardized information about such measures as fetal growth and birth weight among native people has hindered accurate assessment of outcomes.[28]

In the 1950s there was a shift to bottle-feeding of infants among the native population;[22] however, the rate of initiation of breast-feeding has increased since that time.[29,30] A 1988 survey conducted for the National Database on Breastfeeding among Indian and Inuit Women, in which more than 90% of participants were aboriginal, revealed that 60.7% of infants were breast-

fed at birth, but the rate dropped to 31.1% by the time the infants were 6 months old.[29] Breast-feeding rates were lowest among mothers younger than 18.

Mortality

It is difficult to determine patterns in native mortality in Canada since ethnic background is not recorded on death certificates.[31] Mortality rates on Indian reserves have been used as an indicator of native mortality rates; however, many native people do not live on reserves, and reserves include non-native residents.[31] In addition, the heterogeneity and complexity of regional organizations make accurate data collection difficult.[32]

Infants and children

Despite a substantial decline in the infant mortality rate in the native population of Canada during the past two decades,[2,7,33–35] the infant death rate averaged over 1986 to 1990 was still 13.8 per 1000 live births for Indian infants and 16.3 per 1000 for Inuit infants, approximately twice the rate (7.3 per 1000) for all Canadian infants during the same period.[2] The high rate of adolescent pregnancy among native people may be related to infant mortality; Indian mothers living on reserves are, on average, younger than mothers in the nonaboriginal population (9% of Indian mothers v. 1% of non-native mothers are less than 18 years of age).[13] The mortality rate among native neonates (6 per 1000 live births for Indian neonates and 8.4 per 1000 for Inuit neonates respectively) is higher than that in the Canadian population (4.7 per 1000). The postneonatal mortality rate is almost four times greater among native infants.[2] Most of the difference in the infant mortality rate on Indian reserves is due to postneonatal causes of death, including infectious diseases, respiratory illness, sudden infant death syndrome (SIDS) and injuries.[35,36] A study of SIDS in Manitoba showed that the relative risk of an Indian child dying of SIDS, compared with a non-Indian infant, was 3.09.[37] Analysis of the data showed a strong relation between the risk of SIDS and income level. There is also a high incidence of SIDS among US native people, compared with white people.[38]

Native children have much higher rates of death from injuries than all children in Canada.[2] A comparison of Indian children with the total Canadian population of children shows that, for infants, the rate of deaths from injuries is almost four times greater among Indian children (63 v. 17 per 100 000 population); among preschoolers, the rate is more than five times greater (83 v. 15 per 100 000); and among teenagers 15 to 19 years of age, the rate is more than three times greater (176 v. 48 per 100 000). In these data there is no distinction between intentional and unintentional injuries.

Adults

Although the mortality rate among native people declined during the 1980s, it remains higher than the rate for Canada as a whole.[13] According to Mao and collaborators,[31] both a sample of residents of Canadian reserves and a second sample of registered Indians had higher all-cause mortality rates than the total Canadian population. The age-standardized mortality rate (ASMR) from all causes among women living on reserves was 334.6 per 100 000 population for 1979 to 1983 and 276.6 per 100 000 for 1984 to 1988, whereas the rate among all Canadian women was 173.4 per 100 000 for 1979 to 1983. The ASMR among men living on reserves was 561.0 per 100 000 for 1979 to 1983 and 464.9 per 100 000 for 1984 to 1988, compared with 340.2 per 100 000 among all men in Canada for 1979 to 1983. The ASMR among residents of Indian reserves was similar to that among registered Indians as a whole. There was an increased risk of death from alcoholism (including cirrhosis of the liver), homicide, suicide and pneumonia among both categories of the native population. The leading cause of death for the registered Indian population between 1986 and 1988 was injury and poisoning, which accounted for 31.2% of deaths in this population, but for only 7.5% of deaths among all Canadians.[13]

There has recently been a focus on more precise evaluation of mortality rates among subgroups of the native population, since national data can obscure differences among regions and communities. For example, Choinière[39] noted that the Inuit people of northern Quebec had been the focus of studies, whereas little was known about the Inuit people of the Baffin region.

Morbidity

Infectious diseases

Despite significant reductions in rates of tuberculosis (TB) among Inuit people during the past 30 years,[40,41] most aboriginal Canadians continue to be at high risk of TB. Between 1984 and 1989, the estimated incidence rates among registered Indians (73 cases per 100 000 population) and Inuit people (between 63 and 77 cases per 100 000) were approximately nine times the Canadian average.[40,42] Review of cases in British Columbia has shown that Indians there are more likely to have cavitary, infectious, pulmonary TB at the time of diagnosis, compared with other groups in the population, and that, among these people, there is a tendency toward poor compliance with treatment and attendance at clinics.[40]

Canada's native people, in general or particular subgroups, have been reported to be at an increased risk of other infectious diseases, including hepatitis A and B,[7,33] gastroenteritis,[33,36] meningitis[7,33,36] and gonorrhea.[7,33,36] Although there are no comparable Canadian data avail-

able, US surveys of HIV seroprevalence suggest that the US aboriginal people in some regions may have a higher risk of HIV infection than the general US population.[43] Although the rate of reported AIDS cases in the US aboriginal population has been relatively low (4.0 per 100 000 population in 1990), this group had the largest percentage increase in diagnosed cases from 1989 to 1990 of all ethnic groups.[44]

There is some evidence that native children are at an increased risk of infectious diseases, compared with non-native children. Native children in Canada have higher rates of lower respiratory tract infections (bronchitis, pneumonia and croup);[45,46] in one study, the annual rate was 25.6 illnesses per 100 children among non-native children and 75.0 illnesses per 100 children among Indian children.[45] Both children and adults in the native population suffer an increased frequency of acute respiratory infections compared with that among non-native people.[46,47] It has been suggested that infections are not only more frequent but also more severe among native people.[46]

Severe otitis media appears to be more frequent among native children than among non-native people,[48] although one survey of Inuit schoolchildren suggests that the prevalence of chronic ear disease is decreasing.[49] *Haemophilus influenzae* type b (Hib) infections are significantly more common among Inuit infants than among other Canadian infants.[7] There is also evidence of an increased occurrence of nonsuppurative complications of streptococcal disease, including rheumatic fever and glomerulonephritis, in some native populations.[50]

Although the reasons why native people are at an increased risk of some infectious diseases are unknown, suggested risk factors include nutritional problems, genetic factors, poverty and crowding, and environmental pollutants such as tobacco smoke and wood smoke.[46,48,51]

Chronic physical illness

Of the aboriginal population 15 years of age and older, the Aboriginal Peoples Survey found that 31% had been informed by health care professionals that they had a chronic health problem.[52] Table 2 provides a summary of health conditions included in the chronic health problems reported in the survey.

Diabetes mellitus

In 1991, 6% of Canadian native people 15 years of age and older reported that they had diabetes mellitus, whereas 2% of the Canadian population reported having the disease (Table 2).[52] Diabetes mellitus was considered rare among native people until the 1940s,[53] but since then the prevalence of non-insulin-dependent diabetes mellitus (NIDDM) has increased greatly in many communities.[54] However, even in closely related indigenous populations, age-standardized prevalence rates vary widely.[54] Young and colleagues[53] studied the prevalence of diagnosed diabetes mellitus in the circumpolar arctic and subarctic regions of the United States, Russia and Canada. (It was not possible to classify cases according to whether they were insulin-dependent diabetes mellitus or NIDDM). In Alaska alone, the prevalence rate of diabetes mellitus among the Inuit subgroups varied by a factor of four. The age-standardized prevalence rate among those 25 years of age and older in the Northwest Territories was 5.6 per 1000 population among Inuit people and 12.4 per 1000 population among Indian people. All groups had prevalence rates lower than those among most native people in southern Canada. Young and coworkers[55] also evaluated the distribution of diabetes mellitus in native people across Canada. The highest age-standardized prevalence rate was found among

Table 2: Prevalence of chronic health problems among native groups in Canada, 1991*

	No. (and %) of population 15 years of age and older with condition				
Condition	North American Indian people on Indian reserves and settlements *n = 102 075*	North American Indian people off reserves *n = 186 295*	Métis people *n = 84 155*	Inuit people *n = 20 805*	Total† *n = 388 900*
Diabetes mellitus	8 635 (8.5)	9 790 (5.3)	4 670 (5.5)	405 (1.9)	23 255 (6.0)
High blood pressure	13 110 (12.8)	20 635 (11.1)	9 555 (11.4)	1 995 (9.6)	44 735 (11.5)
Arthritis or rheumatism	14 410 (14.1)	27 870 (15.0)	14 375 (17.1)	2 150 (10.3)	57 995 (14.9)
Heart problem	6 940 (6.8)	11 695 (6.3)	5 905 (7.0)	1 275 (6.1)	25 580 (6.6)
Bronchitis	6 190 (6.1)	17 040 (9.1)	8 875 (10.5)	1 035 (5.0)	32 650 (8.4)
Emphysema or shortness of breath	6 785 (6.6)	9 685 (5.2)	4 835 (5.7)	1 120 (5.4)	22 155 (5.7)
Asthma	4 545 (4.5)	11 375 (6.1)	5 755 (6.8)	690 (3.3)	22 135 (5.7)
Tuberculosis	3 445 (3.4)	4 970 (2.7)	2 075 (2.5)	1 350 (6.5)	11 655 (3.0)
Epilepsy or seizure disorder	1 640 (1.6)	2 870 (1.5)	1 030 (1.2)	380 (1.8)	5 910 (1.5)

*Source: Statistics Canada, *The Daily*, catalogue no.11-001E. June 29, 1993: 4. © Minister of Industry, 1993.
†Totals are less than the sum of the preceding groups because many native people are included in more than one group.

native people in the Atlantic region (8.7%), and the lowest rates were found among native people in the Yukon (1.2%), the Northwest Territories (0.8% among Indian people and 0.4% among Inuit people) and British Columbia (1.6%). Native people living in urban areas, women and particularly native people living in southern Canada had an increased risk.[55] In a survey of six native communities in northern Ontario and Manitoba, age, triglyceride level and body mass index were predictive of diabetes mellitus status.[56]

The variation among different subgroups of Canada's native people underscores the need to assess health problems by region.[57,58]

End-stage renal disease

Aboriginal people suffer more end-stage renal disease (ESRD) than other Canadians; the age-standardized incidence rate of newly registered chronic renal failure among native people is 2.5 to 4.0 times higher than the national rate; the total (crude) rate for all Canadians is 5.66 cases per 100 000 population each year.[59] The native population has at least a twofold higher risk of ESRD due to diabetes mellitus, glomerulonephritis and pyelonephritis than the total Canadian population.[59] These data are consistent with reports concerning US native people, which indicate that the incidence of ESRD among these people is much higher than the rate among nonaboriginal people.[60]

Cardiovascular disease

Although cardiovascular disease is a leading cause of illness and death in the Canadian population as a whole, there is limited information about its toll among Canada's native people. Furthermore, little is known about risks for specific peoples or regions in Canada. In a recent study, the population of native people in the Northwest Territories had a lower risk of all circulatory-system disorders than the Canadian population as a whole.[61] However, the risk among Indian women was close to the total Canadian rate.

Specific prevalence data about risk factors for cardiovascular disease, except for smoking (discussed later), in the Canadian aboriginal population are sparse. In a survey of Indian people living in three northwestern Ontario rural communities, the prevalence rate of hypertension was 13%, compared with a rate of approximately 15% among Canadians in general (based on other Canadian studies).[62] However, in a cross-sectional survey of Cree and Ojibwa people, the prevalence of hypertension in the sample was 27%.[63] Among Inuit people in the Northwest Territories, the prevalence of hypertension was lower than the prevalence in Manitoba in all age-sex groups except men 25 to 44 years of age.[61]

Cancer

In a meta-analysis of cancer incidence in the US and Canadian native populations,[64] both men and women were found to have a lower incidence of cancer at all sites combined than the general population. Specifically, native men had lower-than-average rates of cancer of the colon, lung and prostate as well as of lymphoma and leukemia. However, they had a higher rate of kidney cancer. Native women had a significantly higher-than-average incidence of cancer of the gallbladder, cervix and kidney. Band and associates[65] conducted a retrospective analysis of rates of death from cervical cancer among women in British Columbia during a 30-year period. The rate of death was much higher among native Indian women (33.92 per 100 000 population) than among non-native women (8.14 per 100 000) throughout the study period. In the study by Mahoney and Michalek (described earlier),[64] native women were found to have a decreased incidence of cancer of the colon, breast and uterus and of lymphoma. Taken individually, many of the studies would not have shown a significant difference in site-specific cancer incidence because of small samples.[64] These data may be limited because it appears that, in cancer registries, the race of some native North Americans has been misclassified.[66] A study of cancer incidence among population subgroups in the Northwest Territories showed that rates among the Inuit people were higher than expected and rates among the status Indian people were lower than expected, compared with the total Canadian population.[67] Among Inuit people, cancer of the lung, cervix, nasopharynx and salivary gland as well as choriocarcinoma occurred more often, whereas cancer of the breast, uterus, prostate and colon occurred less often, than they did in the total Canadian population.

Social and mental health problems

Many of the social issues (Table 3)[52] reported as problems by aboriginal people are closely linked with mental health problems.

Suicide

Suicide rates among native Canadians are two to three times higher than those among non-native Canadians.[13] Between 1984 and 1988, the 5-year mean annual rate of suicide among registered Indian people in Canada was 36.1 per 100 000 population; suicide rates were highest in Alberta (among women) and the Yukon (among men).[13]

From 1986 to 1990, the mean annual suicide rate among Canadian Indian youth was 37 per 100 000, five times greater than the rate in the total Canadian youth population.[2] Two studies found wide variation in suicide rates among native people in the same province.[68,69]

Bagley[70] showed that high suicide rates were strongly correlated with living in northern Alberta; native reserves in the more prosperous southern region had relatively low suicide rates.

Substance abuse

Substance abuse,[8,71] including drug and alcohol abuse, is a common problem and a major issue of concern to Canada's native people (Table 3).[52]

Adrian, Layne and Williams[72] underscored the need to consider such factors as general economic conditions when interpreting the alcohol consumption of subgroups of the population. For example, although alcohol consumption levels in Ontario counties increase as the native reserve population increases, 60% of the variation in alcohol consumption among counties is accounted for by social factors such as income, rate of employment, northern isolation, amount of tourism, size of households and level of industrial activity.[72] The authors showed that an improvement in economic circumstances reduced alcohol consumption.

Although three recent studies suggest that fetal alcohol syndrome (FAS) is more prevalent among Canadian native children than among non-native children, the evidence is inconclusive.[73] Because there is insufficient information about the prevalence of FAS in the non-native population, it is impossible to conclude that there is a higher prevalence among native people.[73]

A recent Canadian survey examined rates of substance use between 1990 and 1993 among native and white adolescents in a city in the central midwest area of Canada.[74] Each year, the number of students participating exceeded 2400, and the average participation rate was 85%. A greater proportion of native than of white youth indicated use of most substances (e.g., lysergic acid diethylamide [LSD], marijuana, solvents and other hallucinogens) during each of the 4 years. Alcohol was an exception: the groups had comparable rates of alcohol use. Similar results were found in a Quebec study.[75]

Some native communities have identified use of inhaled intoxicants as a major health problem.[71] Solvent use, involving the inhalation of volatile substances such as gasoline, glue and cleaning products, has been increasingly reported in isolated native communities.[76] A survey carried out in 1985 among native youth on 25 reserves in Manitoba reported that 20% of respondents used solvents.[71] The median age of children using solvents was 12, although sniffing was reported among those as young as 4.[71]

Two recent surveys of the smoking behaviour of the indigenous populations of the Canadian arctic showed that Inuit adults had the highest smoking rates, followed by the Dene people and non-native groups.[77] In a survey of Cree children in northern Quebec, 51.4% of children 11 through 18 years of age were classified as current smokers.[78] There is considerable variation in smoking rates among ethnic groups in Canada.[79] Almost 60% of aboriginal people smoke regularly.[79]

Recent surveys suggest that the use of smokeless (chewing) tobacco by native youth in the Northwest Territories[80] and northern Saskatchewan poses a significant health problem.[81] The health consequences associated with smokeless tobacco use are discoloration and abrasion of teeth, gingival recession, leukoplakia, elevation of blood pressure, nicotine addiction and increased risk of cancer (particularly of the oropharynx).[80,82,83]

Mental health

There are few rigorous studies of the mental health of the Canadian native population. One of the best was the Flower of Two Soils Project,[84] which examined the relation among academic performance, psychosocial variables and mental health in aboriginal children and compared it with the mental health factors affecting non-

Table 3: Perception of extent of social problems facing aboriginal communities in Canada, 1991*

	No. (and %) of people reporting that they feel the social issue is a problem in the community where they are living				
Social issue	North American Indian people on Indian reserves and settlements *n = 102 075*	North American Indian people off reserves *n = 186 295*	Métis people *n = 84 155*	Inuit people *n = 20 805*	Total† *n = 388 900*
Suicide	35 195 (34.5)	38 005 (20.4)	18 200 (21.6)	8 575 (41.2)	98 690 (25.4)
Unemployment	79 900 (78.3)	112 195 (60.2)	56 330 (66.9)	15 505 (74.5)	261 100 (67.1)
Family violence	44 975 (44.1)	67 820 (36.4)	32 805 (39.0)	9 040 (43.5)	152 435 (39.2)
Sexual abuse	29 555 (29.0)	40 605 (21.8)	19 350 (23.0)	7 305 (35.1)	95 400 (24.5)
Drug abuse	60 010 (58.8)	80 390 (43.2)	38 060 (45.2)	10 195 (49.0)	186 425 (47.9)
Alcohol abuse	74 715 (73.2)	104 280 (56.0)	49 520 (58.8)	11 980 (57.6)	237 680 (61.1)
Rape	16 735 (16.4)	24 725 (13.3)	12 305 (14.6)	5 190 (24.9)	58 120 (14.9)

*Source: Statistics Canada, *The Daily*, catalogue no.11-001E. June 29, 1993: 5. © Minister of Industry, 1993.
†Totals are less than the sum of the preceding groups because many native people are included in more than one group.

native control children at several sites across the United States and Canada. The Canadian areas included parts of Manitoba and British Columbia. This study examined symptoms of depression and conduct disorder. Native boys were classified as having symptoms of conduct disorder more often than non-native children, by both parents and teachers. There was some question, however, about whether this distinction was due to rater bias; non-native teachers tended to rate native children as having behavioural problems in the classroom more often than did native teachers rating native children.[84] Girls in both groups were more likely to rate themselves as depressed than boys.

Family violence is a major concern in some aboriginal communities.[13] What limited data are available suggest that it is a common and underrecognized problem.[13]

Conclusion

Canadian aboriginal people die earlier than their fellow Canadians, on average, and sustain a disproportionate share of the burden of physical disease and mental illness. This burden is associated with unfavourable economic and social conditions that are inextricably linked to native peoples' history of oppression.[85]

Improving the health of Canada's native people will depend on improving their economic and social conditions as well as assisting native people to identify and address their own health needs. There is an urgent need for region-specific evaluation of the health of native Canadians, including a focus on the positive aspects of native health, such as the reduced incidence of some types of cancer and of cardiovascular disease. However, research priorities in the area of native health should ultimately be determined by native people themselves.

Concerned health care professionals can help native people to develop methods of assessing the health needs of their communities and to design and evaluate interventions that are culturally appropriate to improve the health of native people. They can advocate for services targeting native people and promote the training of native health care professionals. Finally, they can share their knowledge with colleagues in order to foster an increased awareness of native health issues.

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